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North Carolina Board of Health.

METHOD

FOR PERFORMING

Post-Mortem Examinations.

RALEIGH, N. C.:
THE OBSERVER, STATE PRINTER AND BINDER.
JULY, 1879.

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METHOD FOR PERFORMING

Post-Mortem Examinations.*

The following directions for medico-legal post-mortem examinations are prepared for the use of the County Superintendents, for the purpose of placing before them the latest and most approved plans for conducting such examinations, and to establish a uniform method throughout the State. The law makes it obligatory upon the County Superintendents (Sec. 5) to perform these examinations, and in order to make the monthly statistical returns of the greatest value, a careful observance of the following directions is desired by the State Board:

I—General Directions.

1. The Medical Officers who are to perform the Examinations, and their Duties.—The examination of a dead body for medico-legal purposes is, in accordance with the existing law, to be undertaken by the County Superintendent of Health.

The Superintendent performing the examination is charged with the duties of a medico-legal expert.

2. Time of Performance.—Autopsies should not, as a rule, take place until twenty-four hours after death; but the mere inspection of the dead body may be made earlier.

3. Course to be adopted when the Corpse is in a state of Putrefaction.—The presence of putrefaction is not, as a general rule, a sufficient reason for omitting the

*Adapted from the German regulations of 1877, by Dr. Thomas F. Wood, Secretary of the North Carolina Board of Health. Translation from "*The Medical* (London) *Examiner*."

examination, and does not justify the Superintendent in refusing to proceed with his duties. For even if putrefaction be very far advanced, any abnormalities and injuries of the bones can still be ascertained, and likewise many other circumstances, such as the color and state of the hair, the absence of limbs, &c., which may assist in establishing the identity in doubtful cases. Foreign substances within the body may also be discovered, as also the presence or absence of pregnancy and of poisons. When, therefore, the question arises of disinterring a dead body for the purpose of gaining information with reference to conditions of this kind, it is the duty of the physicians to recommend the exhumation, regardless of the time that has elapsed since death took place.

4. Instruments.—The Superintendent should be provided with the following instruments, which are requisite for the performance of the examination: Four to six scalpels—two small, with a straight edge, and two large, with a curved edge. One razor. Two strong cartilage knives. Two pairs of forceps. Two double hooks. Two pairs of scissors; one pair large, having one blade with the point rounded off, the other sharp; the other pair small, one blade probe-pointed, the other sharp pointed. One pair of scissors for laying open intestines. One blow-pipe. One thick probe, and two fine ones. One saw. A mallet and chisel. A pair of bone forceps. Six curved needles of various sizes. A pair of calliper compasses. A tape measure or other measure. A pair of scales, with weights up to 10 lbs. A good magnifying glass. Litmus and turmeric paper.

5. Place for the Examination and Light.—For the examination a sufficiently spacious and light room should be chosen, where the body can be placed in a suitable position, and in a quiet situation. It is not best to perform autopsies by artificial light, except in cases which admit of no delay. In such a case the fact must be expressly alluded

to in the notes, and mention made of the reason which rendered the performance at such a time imperative.

6. Bodies that are Frozen.—If the body is frozen, it is to be brought into a warm room, and the examination is not to be proceeded with until the parts are sufficiently thawed. The employment of warm water or other warm materials for expediting the thawing is not advisable.

7. Transport of Dead Bodies.—In moving the dead body in any way, and particularly in moving it from place to place, the greatest care must be taken to avoid applying any great pressure to any portion of it; and the large cavities should be kept as nearly as possible in a horizontal position.

II—Proceedings at Post-Mortem Examinations.

8. The Judicial Objects of the Examination.—Those charged with making the examination should keep their attention fixed upon the judicial objects in view, and all things which are subservient to these objects must be investigated with minuteness and completeness.

Anything that appears important must be noted down in a minute book, which will be provided on application to the Secretary of the Board.

9. Duties of those charged with the Examination with reference to the ascertaining of Peculiar Circumstances connected with the Case.—It is the duty of those charged with the examination, in cases where it appears to them to be requisite, before the examination is commenced, to request the magistrate for permission to inspect the place where the body was found, and ascertain the position which it occupied, and also to examine the clothes which were found on the deceased.

10. Chemical Examination.—In all cases in which a chemical examination is necessary, the directions issued by the Chemist of the Board (Prof. Ledoux, Chapel Hill,*) should be strictly followed.

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*See page 24.

11. The Examination of the Body.—The examination of the dead body consists of two principal parts:—

A. The external examination (inspection).

B. The internal examination (the dissection).

12. External Examination.—The external examination includes that of the external surface of the body in general and of its separate portions.

With reference to the condition of the body generally, the following are the points to be noticed:—

1. Age; sex; size; bodily conformation; general state of nutrition; any signs of disease, such as ulcers about the legs, peculiar abnormalities, as spots, cicatrices, marks of tattooing, excess or deficiency of limbs.
2. The signs of death and of any decomposition which may be present.

Should the body be soiled with blood, fæces, dirt and the like, these must be washed off, and it must then be ascertained whether rigor mortis is present or not; the color of the skin generally must be noticed, and the kind and degree of any coloration or discoloration due to decomposition that may be present in any part, also the color, position, and extent of the post-mortem stains, which must be cut into and examined carefully, in order to discriminate between such appearances and those due to extravasations of blood.

With reference to individual portions of the body, the following points must be attended to:—

1. When the body is that of a person unknown, the color, and other peculiarities of the hair (of the head and the beard), and likewise the color of the eyes are to be noted.
2. The presence of any foreign substances in the natural apertures of the body, the state of the teeth, and the condition and position of the tongue.

3. Then are to be examined the neck, the chest, the abdomen, the back, the anus, the external organs of generation, and lastly, the limbs.

Should there be an injury on any portion of the body, a description must be given of its shape, position and direction, with reference to fixed points; also its length and breadth in actual measurement. In this external examination, any probing of wounds and injuries is, as a general rule, to be avoided, inasmuch as the depth can be readily ascertained during the internal examination of the body and of the injured parts. If those performing the autopsy deem it necessary to introduce a probe, they must do this very carefully, and state their reasons for so doing in the notes of the proceedings.

When wounds have been discovered, the condition of their borders and surrounding parts is to be determined, and after the examination and description of the wound in its original state, it should be enlarged in order to ascertain the internal condition of its borders and base.

When the body presents wounds and injuries which have clearly nothing to do with the cause of death—for example, marks made in attempts at rescue, bites of animals and the like—it is sufficient that such appearances should be summarily noted.

13. Internal Examination—General Directions.—In the internal examination, the three principal cavities of the body, viz., the head, the thorax and the abdomen are to be opened.

The opening of the vertebral canal, or of separate joints, is never to be omitted in cases in which any information may be expected from such examination.

When there is any definite suspicion with regard to the cause of death, that cavity is first to be opened in which the principal changes are supposed to exist; but in other cases, the head is to be opened first, then the thorax, and lastly the abdomen.*

*With regard to new-born children *see* paragraphs 22 and 23.

In each of these cavities, the first thing to be done is to determine the position of the organs therein contained; then the color and condition of their surfaces, the presence or absence of any unnatural contents, especially of foreign bodies, gases, fluids, or coagula; and with regard to the last two substances, their size and weight should be determined. Each separate organ is finally to be examined both externally and internally.

14. The Cavity of the Skull.—Unless there are any injuries which have to be avoided by the knife, and which would necessitate some other method of procedure, the head is to be opened by means of an incision carried across the middle of the skull from one ear to the other, the soft parts covering the head are then to be reflected backwards and forwards.

Attention having been paid to the condition of the soft parts and of the surface of the bones, these latter are to be sawn through in a circular manner and the skull-cap is to be removed. The cut surface, the internal surface, and the general condition of the cranial arch are to be minutely investigated.

In the next place the external surface of the dura mater is to be examined, the superior longitudinal sinus opened and its contents determined; the dura mater is then to be divided on one side and turned back and its inner surface examined, as also the condition of the exposed portions of pia mater.

After this has been done on the other side, the brain is to be carefully removed and the base of the skull is to be examined for any unusual contents. Attention must be paid to the condition of the dura and pia mater at the base and sides of the skull, and to that of the large arteries.

The transverse sinuses are next to be opened and also the other sinuses (if there is any cause for so doing) and their contents are to be determined. The size and shape of the brain are next to be ascertained, and the color, the fulness

of the vessels, and the consistence and structure of the organ are to be determined by means of a series of incisions through individual portions, viz., the hemispheres of the cerebrum, the great ganglia (the optic thalamus and corpus striatum), the corpora quadragemina, the cerebellum, the pons varolii, and the medulla oblongata.

In addition to this, attention must always be paid to the condition of the tissue and vessels of the Velum interpositum and choroid plexus.

The extent and contents of the different ventricles, and likewise the condition and amount of fulness of the various venus plexuses are to be carefully demonstrated, and the presence or absence of any coagula external to the vessels is to be determined.

Finally, the bones of the base and lateral portions of the skull are to be examined, for which purpose the dura mater must be previously removed.

15. The Face, Parotid Gland and Ear.—When it is necessary to lay bare the internal parts of the face and to exmaine the parotid gland or the ear, the incision carried over the head is to be prolonged behind the ears to the neck, and the skin is to be dissected forward, in order to spare it as much as possible. Particular attention is to be paid to the condition of the large arteries and veins.

16. The Vertebral Column and the Spinal Cord.—The vertebral column is, as a rule to be opened from the posterior aspect. The skin and the subcutaneous fat are first to be divided exactly over the spinous processes; the muscles are then to be removed from the sides of these latter and from the arches of the vertebræ. Extravasations of blood, lacerations and other injuries, particularly fractures of the bones, are carefully to be looked for.

Then a chisel is to be taken, or a vertebral saw, if at hand, and the spinous processes, together with the adjoining portions of the vertebral arches, are to be detached and removed. The dura mater is now exposed, and after its external

surface has been examined, it is to be carefully slit open longitudinally and the presence of any serum, or extravasated blood or other abnormal matters is to be determined. The color, the appearance and general condition of the posterior portion of the pia mater are next to be noticed, and the resistance to pressure of the spinal cord is to be ascertained by gently passing the finger over it.

The roots of the nerves are next to be divided on both sides by a longitudinal incision; the lower end of the cord is to be carefully taken out, its anterior connections are next to be gradually separated and finally the superior extremity is to be removed from the occipital foramen.

In carrying out these directions, great care must be taken that the spinal cord be neither pressed nor bent. When removed, the condition of the pia mater on the anterior aspect is first to be examined, then the size and color (external) of the spinal cord are to be noted, and lastly numerous transverse incisions are to be made with a very sharp and thin knife, to determine the internal condition of the spinal cord, both of its white strands and of the grey substance. Lastly, the dura mater is to be removed from the bodies of the vertebræ, and the dissector is to examine for effusions of blood, or injuries or alterations in the bones or intervertebral cartilages.

TABULAR PLAN OF PARTS OPPOSITE THE SPINES OF THE VERTEBRA.*

Cervical.	7th. Apex of the lung: higher in the female than in the male.
Dorsal Spines.	1st.
	2nd.
	3rd. Aorta reaches spine. Apex of lower lobe of lung. Angle of bifurcation of trachea.
	4th. Aortic arch ends. Upper level of heart.
	5th.
	6th.
	7th.
	8th. Lower level of heart. Central tendon of diaphragm.
	9th. Œsophagus and vena cava through diaphragm. Upper edge of spleen.
	10th. Lower edge of lung. Liver comes to surface posteriorly. Cardiac orifice of stomach.
	11th. Lower border of spleen. Renal capsule.
	12th. Lowest part of pleura. Aorta through diaphragm. Pylorus.
Lumbar.	1st. Renal arteries. Pelvis of kidney.
	2d. Termination of spinal cord. Pancreas. Duodenum just below. Receptaculum chyli.
	3d. Umbilicus. Lower border of the kidney.
	4th. Division of aorta. Highest part of ilium.
	5th.

17. Neck, Thorax, and Abdomen.—General Directions.—In opening the neck, thorax, and abdomen, it is

*Holden's Landmarks, Amer. Ed., p. 51.

generally sufficient to make one long incision from the chin to the pubes, passing to the left of the umbilicus. In ordinary cases, the incision is to be carried right into the abdominal cavity, care being taken not to injure any of the contents. The best plan is to make at first a very small incision into the peritoneum. Notice must be taken whether any gas or fluid escapes. First one and then a second finger is introduced, the integuments are raised from the contents, and the further incision through the peritoneum is to be made between the two fingers.

Notice must then be taken of the position, color, and appearance in other respects of the exposed viscera, and of any foreign contents that may be present, and the position of the diaphragm is to be determined by examination with the hand.

The examination of the abdominal organs is not to be continued at this stage unless there be particular reasons for believing that the cause of death will be found in the abdominal cavity (Section 13). As a general rule, the examination of the thorax must precede the further examination of the abdomen.

18. The Thorax.—For opening the thorax it is necessary that the soft part of the chest should first be dissected back beyond the points of attachment of the cartilages to the ribs. The cartilages are then to be divided with a strong knife about a third of an inch internal to their attachments. Care must be taken to avoid injuring the lung or the heart. When the cartilages are ossified, the best plan is to divide the ribs with a saw or bone-forceps a little external to the attachments of the cartilages. The clavicles are then to be separated from the manubrium of the sternum by means of a crescentic incision, the knife being held vertically, and the junction with the first rib, whether cartilaginous or bony, is to be divided with the knife or bone-forceps, the greatest care being taken to avoid injuring the vessels lying beneath. Then the attachments of the diaphragm, between the ends of the two incisions, are to be divided close to the cartilages

of the false ribs and the ensiform cartilage, the sternum is to be turned upwards, and the mediastinum cut through, care being taken to avoid injuring the pericardium and large vessels.

After removing the sternum, the condition of the pleural cavities is to be determined; the presence, condition, and quantity of any abnormal contents, the state of distension and the general appearance of the exposed portions of lung are to be noticed. If, in the removal of the sternum, any vessel has been injured, this must be tied, or a piece of sponge must be applied to it to prevent the blood from escaping into the pleural sac, where its presence might give rise to mistakes. The condition of the mediastinum, the state of the thymus gland, and likewise the condition of the large vessels outside the pericardium (which vessels, however, are not yet to be opened) are now to be noticed.

Then the pericardium is to be opened, and its condition noticed and the heart examined. With regard to the latter, its size, the fulness of the coronary vessels and of its separate cavities (auricles and ventricles,) its color and consistence (post-mortem rigidity) are all to be noticed before any incision is made and before the heart is removed from the body. Then, while the heart is still unsevered from its natural connections, each ventricle and each auricle are to be separately opened and the contents of each cavity are to be determined with regard to their quantity, state of coagulation and general appearance, and the size of the auriculo-ventricular valves is to be tested by introducing two fingers from the auricle. Then the heart is to be removed; the condition of the arterial openings is first to be tested by pouring in water, and then, after an incision has been made, the condition of the muscular tissue of the heart is to be noticed with reference to its color and general appearance. If there be reason to suppose that the muscular structure has undergone considerable alteration—fatty degeneration,

for example—a microscopical examination must always be made.

The examination of the heart is to be followed by that of the large vessels, but the descending aorta is to be left until the lungs have been examined. In order to examine the lungs minutely, they must be removed from the thoracic cavity. Their removal must be effected with great care, and the lung-tissue must not be torn or squeezed. If extensive adhesions exist, and particularly if they are old-standing, they must not be divided, but a portion of the costal pleura should be removed with the attached adhesions. After removal of the lungs, their surface is to be again carefully examined, in order that recent changes—for example, the commencement of inflammatory exudation—may not be overlooked. The capacity for air, the color, and the consistence of each portion of the lungs, are to be noticed; finally, large smooth incisions are to be made, and the following points attended to: the state of the cut surfaces; the amount of air, blood, and serum; the presence of any solid contents in the pulmonary vesicles; the condition of the bronchial tubes and pulmonary artery, with especial reference to obstruction, &c., in the latter. For this purpose the air-passages and the large branches of the pulmonary artery are to be divided with the scissors, and followed out to their finer ramifications.

In cases where it is suspected that foreign matters have entered the air-passages, and where substances, the nature of which is not evident on simple inspection, are found in the air-tubes, recourse should be had to the microscope to determine their nature.

19. The Neck.—According as circumstances may require, the neck may be examined either before or after the opening of the thorax or the removal of the lungs. Those performing the autopsy may, if they think fit, make a special examination of the larynx and air tubes, if such investigation be

of particular importance, as, for instance, in cases of death from strangulation or drowning.

As a general rule, the best plan is first to examine the large vessels and the nerve-trunks, and afterwards to open the larynx and trachea by an incision carried along their anterior aspect, and to examine their contents. In cases where it is especially important to examine these parts, they should be looked to before the lungs are removed from the body, and pressure should be carefully made upon these latter organs in order to see whether any liquid matters, &c., ascend into the trachea.

The larynx is then to be removed, together with the tongue, the soft palate, the pharynx, and the œsophagus; each of these parts is to be incised, and its condition ascertained, the state of the mucous membrane being particularly noticed. The thyroid gland, the tonsils, the salivary glands, the cervical lymphatic glands, are all to be examined.

In cases where the larynx or trachea has been injured, or where important changes are supposed to exist in these parts, an incision is not to be made into them until they have been removed from the body, and they are then to be opened from their posterior aspect.

Where death has resulted from strangulation, or presumably from suffocation, and the carotid arteries are opened in order to ascertain whether there is any injury of the lining membrane, the vessels should be examined while still in their natural position.

Finally, the state of the cervical vertebræ and of the deep muscles of the neck should be noticed.

20. The Abdomen.—In the further examination of the abdominal cavity and of its contents, a certain order of sequence is always to be adopted, so that the removal of an organ shall not interfere with the minute investigation of its relations to other parts. Thus the duodenum and biliary ducts should be examined before the removal of the liver. As a general rule, the following order of sequence is

advisable:—1. The omentum. 2. The spleen. 3. The kidneys and suprarenal capsules. 4. The urinary bladder. 5. The organs of generation (in the male subject, the prostate gland and vesiculæ seminales, the testicles, the penis, with the urethra; in the female, the ovaries, Fallopian tubes, uterus, and vagina). 6. The rectum. 7. The duodenum and stomach. 8. The gall duct. 9. The liver. 10. The pancreas. 11. The mesentery. 12. The small intestine. 13. The large intestine. 14. The large blood vessels in front of the vertebral column, their contents to be examined and determined.

The Spleen.—The length, breadth, and thickness of the spleen are to be ascertained while the organ is lying free and not when placed in the hand, and the spleen is not to be compressed by the measure. A longitudinal incision is then to be made, and if any alterations of structure are manifest the organ should be incised in various directions. The quantity of blood is always to be noticed.

The Kidneys.—Each kidney is to be removed by a vertical incision through the peritoneum, external to and behind the ascending or descending colon, the intestine is to be pushed aside, and the kidney detached from its connections. The capsule is then to be carefully removed, a long incision being made into it over the convex border of the kidney. The surface thus exposed is to be noticed with reference to the size, shape, color, quantity of blood contained, and any morbid appearances that may be present. A long incision is then to be made through the kidney, as far as its pelvis, the cut surface is to be washed with water, and described with reference to the condition of the cortical and medullary substance, vessels, and parenchyma.

The Pelvic Organs.—The organs of the pelvis (the bladder, the rectum, and the generative organs therewith connected) are best removed together, but the bladder should first be opened *in situ*, and its contents determined. Then the parts should be further examined, the generative organs

being taken last. The vagina should be opened and examined before the uterus. In examining the body of a woman who has died after delivery, special attention should be paid to the condition of the veins and lymphatics, both in the inner surface of the uterus and in its walls and appendages, the size and contents of the vessels being especially noted.

The Stomach and Duodenum.—The condition externally of the stomach and duodenum is first to be ascertained while the parts are *in situ*. Then, with a pair of scissors, the duodenum is to be slit up on its anterior aspect, and the stomach along the great curvature; the contents are then to be examined, the permeability of the gall duct and any matter contained therein are also to be noticed, and then the parts are to be removed for further examination.

The Liver.—The external appearance of the liver is first to be described, and the organ is to be removed after the examination of the excretory ducts. Long, smooth incisions are then to be carried transversely through the organ, and the amount of blood and general condition of the parenchyma are to be ascertained. The description is to contain a short account of the general condition of the lobules, the appearance of their centres and circumference being particularly noticed.

Small and Large Intestines.—The small and large intestines are to be examined with reference to the degree of distension, color, and other external appearances; they are then to be removed together, the mesentery being cut through close to the intestines. After removal, the intestine is to be slit up with the scissors along the line of the attachment of the mesentery. As this is being done, the contents of each portion are to be noticed and estimated. Then the intestine is to be well cleansed with water, and the condition of the various portions noticed, particular attention being paid to the agminate and solitary glands, the villi, and valvulæ conniventes of the small intestine. In every

case of peritoneal inflammation, examine carefully the vermiform appendage.

21. Cases of Poisoning.—In cases where poisoning is suspected, the abdominal cavity is to be first examined. Before anything further is done, attention is to be paid to the external appearance of the principal viscera, their position and size, the fulness of their vessels, and also as to whether there be any odor perceptible.

With regard to the vessels, the points here to be determined, as in other important organs, are as follows :—Are the vessels arteries or veins? Does the congestion prevail in the finer ramifications, or only in the trunk and branches of a certain size? Are the intervascular spaces of considerable extent or not?

Double ligatures are then to be placed around the terminal portion of the œsophagus, just above the cardiac orifice, and two more around the duodenum, below the opening of the gall-duct. The parts are to be divided between the ligatures. The stomach is then to be removed with the duodenum, care being taken to avoid injuring the parts. They are then to be opened as described in Section 20.

The contents are to be examined with regard to the quantity, consistence, color, composition, reaction, and smell, and placed in a clean porcelain or glass vessel, following the directions of the Chemist of the Board of Health.

The mucous membrane is then to be washed with water, and its color, thickness, surface, and consistence are to be noticed. Particular attention is to be paid to the state of the blood-vessels, and to the tissue of the mucous membrane generally, and of each of the principal portions of the stomach. Care should be taken to ascertain particularly whether any blood that may be present is within the vessels or extravasated, also whether it is recent or altered by putrefaction or digestion, and under these circumstances has penetrated by imbibition into the parts around. If extra-

vasated, its situation should be determined—whether on the surface or in the tissue, and whether coagulated or not.

The surface of the mucous membrane is to be carefully examined for any breaches of continuity, such as loss of substance, erosions, or ulcers. The question as to whether the alterations manifested may have occurred after death, from natural decomposition, or from the action of the fermenting contents of the stomach, is to be carefully kept in mind.

This examination having been completed, the stomach and duodenum are to be placed in the vessel which contains the contents (see above,) and delivered to the Chemist of the Board, for further investigation. The œsophagus, having been tied in the neck and divided above the ligature, and subjected to examination, is also to be placed in the same vessel. In a case where the stomach contains but very little the contents of the jejunum should be retained in like manner.

Lastly, other materials and portions of organs, such as blood, urine, pieces of liver, kidneys, &c., are to be taken from the body separately for further examination. The urine is to be placed in a separate vessel. The blood is to be kept separately only in cases where a definite conclusion may be anticipated from spectrum-analysis.

Portions of organs reserved are to be placed together in one vessel.

Each vessel is to be carefully closed, sealed, and marked.

If on simple inspection the gastric mucous membrane appears particularly opaque and swollen, no time should be lost in examining it with the microscope, especial attention being paid to the condition of the peptic glands.

The microscope is also to be used in cases where the stomach contains any suspicious substances, such as portions of leaves or other vegetable matters, the remains of animal substances taken as food, &c.

Where trichiniasis is suspected, the contents of the stomach

and upper part of the jejenum are first to be subjected to microscopical examination, but portions of the muscular tissue (of the diaphragm, cervical and pectoral muscles) are to be put aside for further investigation.

22. New-born Children: Determination of Maturity and Period of Development.—In the post-mortem examination of new-born children special attention is to be directed to the following points in addition to the above-mentioned general rules:—

In the first place, the signs indicative of maturity and period of development must be ascertained.

These are—the length and weight of the child, the condition of the general integuments and of the umbilical cord, the length and state of the hair of the head, the size of the fontanelles, the diameter of the cranium (longitudinal, transverse, and diagonal,) the condition of the eyes (membrana pupillaris,) the state of the cartilages of the nose and ear, the length and condition of the nails, the transverse diameter of the body at the shoulders and hips; in male infants, the condition of the scrotum and position of the testicles; in females, the condition of the external organs of generation. Finally, we must examine the size of the centre of ossification (if present) in the inferior epiphysis of the femur. For this purpose, the knee-joint must be opened by means of a transverse incision below the patella, the joint fully bent and the patella removed; thin layers are then to be cut from the cartilaginous end of the femur, till the greatest transverse diameter of the centre of ossification (if present) be reached; this is to be measured.

Should the condition of the fœtus be such as clearly to prove that it was born before the completion of the thirtieth week, it is not necessary to proceed further with the examination.

23. Determination of the Question whether the Child has Breathed.—If it shall appear that the child has been born after the thirtieth week, we must in the next

place ascertain whether it has breathed during or after birth. For this purpose the respiration test must be applied, and the proceedings conducted in the following order:—

(*a*). Immediately on opening the abdominal cavity the position of the diaphragm is to be ascertained with reference to the corresponding rib, and on this account in new-born children the abdomen is always to be opened first, and afterwards the thorax and cranium.*

(*b*). Before opening the thorax a ligature is to be placed around the trachea above the sternum.

(*c*). The thorax is then to be opened, and attention must be paid to the amount of dilatation of the lungs and their position dependent upon such dilatation, particularly with reference to the pericardium. The color and consistence of the lungs should be also ascertained.

(*d*). The pericardium is then to be opened, and its condition and that of the heart externally are to be ascertained.

(*e*). The cavities of the heart are then to be opened, and their contents to be examined, and the condition of the heart in other respects is to be determined.

(*f*). The larynx and the portion of the trachea above the ligature are then to be opened by means of a longitudinal incision, the condition of their walls is to be ascertained, and any contents are to be examined.

(*g*). The trachea is to be divided above the ligature and removed, together with all the organs of the thorax.

(*h*). After removing the thymus gland and the heart, the lungs are to be placed in a capacious vessel filled with clean cold water, in order to test their buoyancy.

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*The dissection, however, of the abdominal organ is never to precede the opening and examination of the thorax.

(*i*). The lower part of the trachea and its sub-divisions are to be laid open and examined, especially with reference to their contents.

(*k*). Incisions are to be made in both lungs, and notice taken whether any crepitating sound be heard, and also with reference to the amount and quality of the blood issuing from these cut surfaces on slight pressure.

(*l*). Incisions are to be made into the lungs below the surface of the water, in order to see whether any air-bubbles rise from the cut surfaces.

(*m*). Both lungs are next to be separated into their lobes and these are to be divided into several small pieces, and the bouyancy of each of these portions is to be tested.

(*n*). The œsophagus is to be opened and its condition ascertained.

(*o*). Lastly, in cases where it is suspected that air cannot gain access to the lungs in consequence of the filling-up of their cells and passages with morbid products (hepatization) or foreign substances (mucus, meconium), the lung-tissue is to be examined with the microscope.

24. Other Examinations.—In the last place it is the duty of those performing the examination to examine all other organs or parts not mentioned by name in the regulations, in any case in which the parts in question are found to be injured or otherwise abnormal.

25. End of the Examination—The Cavities to be closed.—The examination being completed and the body cleansed as far as possible, it is the duty of the Superintendent to close up carefully those cavities of the body which have been opened.

III.—Making the Report of the Examination.

26. The Report of the Examination.—A report of eve-

rything connected with the post-mortem examination should be made out at once on the blanks furnished, adding additional remarks on the back if necessary.

27. Arrangement and Drawing up of the Report.—The technical portion of the report of the autopsy must be made out by the Superintendent of Health; it must be clear, definite, and intelligible.

The appearances found must be accurately described as matters of fact and not in the form of mere opinions (*e. g.*, "inflamed," "gangrenous," "healthy," "normal," a "wound," an "ulcer," and the like.) But the Superintendents may, if they please, for the sake of distinctness, add to the statement expressions in parentheses to indicate what they have actually observed.

In every case a statement must be given with regard to the quantity of blood in each important part, and what is required in a terse description, and not merely an opinion expressed in such terms as "intensely," "moderately," "somewhat," or "very reddened," "full of blood," "bloodless." In the description the size, shape, color, and consistence of the various parts are to be observed and noted before making any incisions.

28. Opinion.—At the conclusion of the autopsy, if any particular facts influencing his opinion have come to his knowledge, whether from the proceedings or otherwise, these should be briefly mentioned.

If the cause of death has not been discovered, the fact must be expressly mentioned. It is never sufficient to say that the death has resulted from internal cause or from disease; the disease must be specified.

In cases where further technical examination is necessary, or where there are any doubtful circumstances, it is better for the Superintendent to postpone his opinion until more minute examination is made.

29. Supplemental Explanation with regard to Weapons.—If there be any injuries on the dead body which may

have been the cause of death, and if it be suspected that a weapon that has been discovered has been used to cause the injuries, then the Superintendent of Health must institute a comparison between them, and must state whether and what injuries could have been caused by the weapon, and whether any conclusions can be drawn from the position and condition of the injury as to the mode in which the perpetrator has acted, and as to the force used.

Should weapons not be forthcoming, the Superintendents should express an opinion, as far as the appearances will permit, with regard to the way in which the injuries may have originated, and with reference to the nature of the weapons employed.

The report of the examination is to be signed by the Superintendent of Health, and if another physician has assisted at the autopsy, it should be stated.

NOTE.—*Virchow's directions as to how incisions should be made.*—It may serve as a useful hint even to those quite familiar with old time methods to quote from Prof. Virchow's "*Method of performing post-mortem examinations.*" "For all ordinary purposes of pathological dissection, I now grasp the handle of the knife in the palm of my hand, so that when I stretch out my arm the blade appears as a direct prolongation. I fix then relatively, if not absolutely, the joints of the fingers and hand, and make the cutting movements with the entire arm, so that the principal movements occur in the shoulder-joint, the secondary ones in the elbow. In this way I am able to make long and useful incisions, and smooth ones as well, for I can utilize the whole force of the arm, and especially of the muscles about the shoulder; and it is only on surfaces produced by such incisions as these that we are able to see anything really satisfactorily." English Edition, p. 25.

" * * A good pathological anatomist is perfectly able to dissect all the viscera of one subject, or even of two, with one knife, a pathological 'layman,' holding his knife as he would a pen, requires three or four knives for one autopsy." p. 26.

"I maintain that a free incision, even when wrongly done, is, as a rule, to be preferred to a small though accurate one, and is almost always better than several or many small cuts. The large even cut is peculiarly the one for demonstration purposes. To make it, I look carefully at each separate organ, to find where I can get the largest surface on section. I

therefore cut through a spleen from above downwards, over the middle of its outer (convex) surface, a kidney from without and within (from the external to the internal border,) a liver from right to left in a horizontal direction ; the testicle I cut into two equal parts in a perpendicular direction from its free to its attached border, and snap the parts asunder. I divide each lobe of the lung by a perpendicular incision directed from above downwards, and from its thicker border towards the inner (anterior, medial, sharp) one. Each hemisphere of the brain I divide by an incision beginning internally just over the corpus striatum, and directed somewhat obliquely outwards. Each hemisphere of the cerebellum I divide by an incision which commences in the fourth ventricle, in the direction of the crus cerebelli, and is carried obliquely outwards."

METHOD OF PROCEDURE IN CASES OF SUSPECTED POISONING.

LABORATORY OF THE N. C. EXPERIMENT STATION,
CHAPEL HILL, April 24th, 1878.

To the Coroners and County Superintendents of Health of the State of North Carolina:

I beg to call attention to Section 14 of "An Act Supplemental to an Act creating a State Board of Health," passed by the late Assembly and ratified on March 14th. This Section is as follows:

"SEC. 14. When the County Superintendent of Health shall, in the course of his investigation required at coroner's inquest, think it necessary to subserve the ends of justice that a chemical analysis of the *viscera* or fluids of the body be made, he shall carefully pack up and seal the suspected article in a proper receptacle, in the presence of a witness, and forward it to the chemist of the agricultural station for analysis. (Such analysis shall be made free of charge, and be returned to the coroner of the county, such analysis having precedence over other matters of investigation not of a similar character, then in the laboratory of the chemist.)"

* * * * * * *

The Board of Agriculture, recognizing not only the claims of the law but the claims of humanity upon them, have made arrangements by which the analyses in question can be made through the Experiment Station. Knowing that were I compelled to make such analysis in person, it would occasion great delay and serious interference with my work, especially during my long abscences from my post when testifying at Court, &c., they adopted the following resolution:

"*Resolved*, That the Chemist of the Board be authorized to employ such additional labor as may be necessary to

prosecute the analyses in cases of suspected poisoning, as required by Section 14 of An Act Supplemental to an Act creating a State Board of Health, at an expense for the same of not more than ..... dollars per annum."

In compliance with the above resolution of the Board, I have secured the co-operation of Prof. A. F. Redd, of the University, who will devote himself to any cases which may arise under the provisions of the law above cited. Prof. Redd has made all the analyses of this character that have been required in the State during the last two years, so far as I am informed. Your attention is called to the following instructions, which should be followed as nearly as possible to comply with the law and to secure an analysis which will stand in Court:

1st. Except in special cases, it will be sufficient to place the stomach, the whole of the liver and spleen and the bladder each in a separate, perfectly clean glass jar, with tightly fitting glass top (a fruit jar serves well). Care should be taken that none of the contents of the stomach or bladder escape. No disinfectant or preservative should be added in any case.

2d. Seal each jar thoroughly and label distinctly with the name of its contents.

3d. Secure, if possible, any vomit or urine voided immediately before death, and also any liquids, powders or other substances which are suspected of having caused death, or any vials or other receptacles which may have contained the poison, sealing each as before.

4th. Let these jars be delivered at the Station by some one, properly authorized, in person. Do not send by express. The person bringing the jars should never allow them (or the receptacle in which they may be packed), to get out of his sight, unless to go under a lock, to which the carrier holds the key. The messenger will bring the jars to the Experiment Station and deliver them to me, or to Prof. Redd in my presence.

The expenses of these analyses will be defrayed by the Department of Agriculture, but the pay of Prof. Redd in attendance upon Court will still be regulated by the laws specially providing for the remuneration of witnesses and experts.

Respectfully,

ALBERT R. LEDOUX,

Chemist to the Department of Agriculture.

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